

WHAT IS CLAIMED IS:

1. A method for inducing an enhanced immunological response against an HIV-1 antigen in a mammalian host, said method comprising the steps of:

5 (a) inoculating the mammalian host with a recombinant adenoviral vector at least partially deleted in E1 and devoid of E1 activity comprising a gene encoding an HIV-1 antigen or immunologically relevant modification thereof; and thereafter

10 (b) inoculating the mammalian host with a boosting immunization comprising a recombinant poxvirus vector comprising a gene encoding the HIV-1 antigen or immunologically relevant modification thereof; provided said poxvirus vector is replication-impaired in the mammalian host.

15 2. A method in accordance with claim 1 wherein the adenoviral vector is of serotype 5.

3. A method in accordance with claim 2 wherein the recombinant adenoviral vector is deleted of base pairs corresponding to base pairs 451-3510 of a wildtype adenovirus serotype 5 genome.

20 4. A method in accordance with claim 1 wherein the adenoviral vector is of serotype 6.

25 5. A method in accordance with claim 1 wherein at least one of the genes encoding the HIV-1 antigen or immunologically relevant modification thereof comprises codons optimized for expression in a human.

6. A method in accordance with claim 1 wherein the recombinant adenoviral vector comprises a gene expression cassette comprising:

30 (a) a nucleic acid encoding an HIV-1 antigen;
(b) a heterologous promoter operatively linked to the nucleic acid encoding the antigen; and
(c) a transcription termination sequence.

7. A method in accordance with claim 1 wherein the recombinant poxvirus vector comprises a gene expression cassette comprising:

- (a) a nucleic acid encoding an HIV-1 antigen; and
- (b) a promoter operatively linked to the nucleic acid encoding the antigen; provided that said promoter is derived from or native to a poxvirus.

8. A method in accordance with claim 6 wherein the gene expression cassette in the recombinant adenoviral vector is inserted into the E1 region.

9. A method in accordance with claim 8 wherein the gene expression cassette in the recombinant adenoviral vector is in an E1 parallel orientation.

10. A method in accordance with claim 6 wherein the promoter is a cytomegalovirus promoter devoid of intronic sequences.

11. A method in accordance with claim 10 wherein the promoter is an immediate early human cytomegalovirus promoter.

12. A method in accordance with claim 7 wherein the promoter is a synthetic early/late promoter of vaccinia virus.

13. A method in accordance with claim 6 wherein the transcription termination sequence is a bovine growth hormone polyadenylation and transcription termination sequence.

14. A method in accordance with claim 6 wherein the HIV-1 antigen is HIV-1 gag.

15. A method in accordance with claim 7 wherein the HIV-1 antigen is HIV-1 gag.

16. A method in accordance with claim 6 wherein the gene expression cassette comprises an open reading frame encoding an HIV-1 gag protein or immunologically relevant modification thereof.

17. A method in accordance with claim 7 wherein the gene expression cassette comprises an open reading frame encoding an HIV-1 gag protein or immunologically relevant modification thereof.
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18. A method in accordance with claim 1 wherein the poxvirus vector is attenuated.
19. A method in accordance with claim 1 wherein the poxvirus vector is a vaccinia virus vector modified so as to render the virus replication-defective within the treated mammalian host.
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20. A method in accordance with claim 1 wherein the poxvirus vector is an avipoxvirus.
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21. A method in accordance with claim 1 wherein the poxvirus vector is a fowlpoxvirus.
22. A method in accordance with claim 1 wherein the poxvirus vector is MVA.
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23. A method in accordance with claim 1 wherein the poxvirus vector is the NYVAC strain of vaccinia virus.
24. A method in accordance with claim 1 wherein the poxvirus vector is ALVAC.
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25. A method for inducing an enhanced immunological response against an HIV-1 gag antigen in a mammalian host, said method comprising the steps of:
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- (a) inoculating the mammalian host with a recombinant adenoviral vector of serotype 5 at least partially deleted in E1 and devoid of E1 activity comprising a gene encoding an HIV-1 gag antigen or immunologically relevant modification thereof; and thereafter

(b) inoculating the mammalian host with a boosting immunization comprising a recombinant poxvirus vector comprising a gene encoding the HIV-1 gag antigen or immunologically relevant modification thereof; provided said poxvirus vector is replication-impaired in the mammalian host.

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26. A method for inducing an enhanced immunological response against an HIV-1 antigen in a mammalian host, said method comprising the steps of:

(a) inoculating the mammalian host with a recombinant adenoviral vector at least partially deleted in E1 and devoid of E1 activity comprising a gene
10 encoding an HIV-1 antigen or immunologically relevant modification thereof; and thereafter

(b) inoculating the mammalian host with a boosting immunization comprising a recombinant ALVAC vector comprising a gene encoding the HIV-1 antigen or immunologically relevant modification thereof.

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27. A method for inducing an enhanced immunological response against an HIV-1 gag antigen in a mammalian host, said method comprising the steps of:

(a) inoculating the mammalian host with a recombinant adenoviral
20 vector at least partially deleted in E1 and devoid of E1 activity comprising a gene encoding an HIV-1 gag antigen or immunologically relevant modification thereof; and thereafter

(b) inoculating the mammalian host with a boosting immunization comprising a recombinant ALVAC vector comprising a gene encoding the HIV-1 gag
25 antigen or immunologically relevant modification thereof.

28. A method for inducing an enhanced immunological response against an HIV-1 antigen in a mammalian host, said method comprising the steps of:

(a) inoculating the mammalian host with a recombinant adenoviral
30 vector at least partially deleted in E1 and devoid of E1 activity comprising a gene encoding an HIV-1 antigen or immunologically relevant modification thereof; and thereafter

(b) inoculating the mammalian host with a boosting immunization comprising a recombinant MVA vector comprising a gene encoding the HIV-1 gag antigen or immunologically relevant modification thereof.

5 29. A method for inducing an enhanced immunological response against an HIV-1 gag antigen in a mammalian host, said method comprising the steps of:

 (a) inoculating the mammalian host with a recombinant adenoviral vector at least partially deleted in E1 and devoid of E1 activity comprising a gene
10 encoding an HIV-1 gag antigen or immunologically relevant modification thereof; and thereafter

 (b) inoculating the mammalian host with a boosting immunization comprising a recombinant MVA vector comprising a gene encoding the HIV-1 gag antigen or immunologically relevant modification thereof.

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